Name: Abby Simons Date: 7/19/10

Lesson Title: Manipulating equations into Unit Title: Week 5

Slope-intercept form Grade Level: 8th

Objectives:

* Students will be able to restate the story of King Hieron
* Students will be able to identify the pieces of equations in slope-intercept form
* Students will be able to manipulate equations into slope-intercept form

Set Induction:

* Take attendance
* Hand back any paper
* Students will take out their homework logs and fill in tonight’s homework
* Review t-tables from last week. When I gave you either the x-coordinate or the y-coordinate, I also gave you an equation that was similar that something that looked like y = 3x -2. I may have given your x-coordinate and asked you to substitute that value in for x in order to find the y-coordinate. Once you got the y-coordinate, you had the ordered pair of the point that will lie along the line with that equation. Today we will learn what the equation that I gave you means.
* (3 min)

Content Outline and Learning Activities:

* Mathematical Topic of the Week – the story of Archimedes and the Crown of King Hieron.
  + Background information on Archimedes
    - Born around 287 BC in Syracuse, Sicily. Mathematician. Studied in Alexandria Egypt.
    - How he died.. during the Second Punic War when the Romans under General Marcus Claudius Marcellus captured Syracuse. A soldier came to Archimedes and told him to come with him to meet the General. Archimedes refused because he was working on some kind of mathematical diagram. The soldier got mad that Archimedes was not obeying his orders and killed him. The General wanted Archimedes alive, so was angered by this.
  + Used his principle of buoyancy to uncover a fraud against King Hieron of Syracuse. The king had a crown that was supposedly made of solid gold. The king thought that the crown was not made of solid gold, so he got Archimedes to figure out if it was made of solid gold or not. So Archimedes took two equal weights of gold and silver and compared their weights when put in water. Then he compared the weights of the crown and a pure silver crown of identical dimensions when each was immersed in water. The difference between these comparisons showed that the crown was not made of pure solid gold. Used ratios to uncover this.
  + (7 min)
* Write y = mx + b on the board. Ask the students if they have ever seen this before? Do they know what it is called? (equation of a line in slope intercept form).
  + See how the students answer and see if any of the students know about this.
  + (2 min)
* Now, hand out Slope-intercept form worksheet. Go over these notes with the students. (20 min)
  + Make sure students have mastered what each piece of the slope-intercept form represents and that they can manipulate equations into slope-intercept form.
* Students will take out notebook paper, and now we will talk about slope.
  + If we are given at least two points we can calculate the slope of the line between these two points.
  + Slope is like an instruction manual. It tells you how to get to the next point. Remember that points are defined as an ordered pair with 2-coordinates. So slope shows us the direction we would move to the next point using both the x and y axes
  + Slope = rise / run = (yb – ya) / (xb – xa)
    - Ask students what does this mean!!!!!!
    - Remember that I said you need at least two points to calculate slope. So we will have two ordered pairs, points a and b. These points in general form will look like (xa, ya), (xb, yb).
  + When I said that slope = rise / run it is equal to the change in the y direction divided by the change in the x direction.
  + Let’s calculate the slope given two points
    - Point a = (5, 3). Point b = (9, -1)
      * Slope = (-1 – 3)/(9 – 5) = -4 / 4 = -1
    - Point a = (2, 3). Point b = (5, 10)
      * Slope = (10 – 3)/(5 – 2) = 7/5
    - Point a = (4, 5). Point b = (-6, 8)
      * Slope = (8 – 5)/(-6 – 4) = 3/-10
  + (10 min)

Closure:

* Hand out homework due tomorrow 7/20/10 – Slope-Intercept Form Homework
* Review the parts of general equation of a line in slope-intercept form
  + y = any y coordinate
  + m = slope
  + x = any s coordinate
  + b = y intercept (where the line hits the y axis)
* (3 min)

Evaluation Procedure:

* Slope-Intercept form Homework due 7/20/10

Additional Notes:

* Slope-intercept form worksheet
* Slope-intercept form worksheet answers
* Slope-intercept form homework
* Slope-intercept form homework answer key

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Slope-Intercept form notes

What is the general equation for a line in slope-intercept form?

y = mx + b

Note: this is a general form. That means that this equation is the official definition of lines in slope-intercept form.

So, what do the pieces in slope-intercept mean?

y = any y-coordinate on the line

m = slope

x = any x-coordinate on the line

b = y-intercept

1. Directions: Given the following equations, identify the pieces of each line that is in slope-intercept form.
   1. y = 5x + 9
   2. y = 2x – 6
   3. y = -3x + 7

We will learn the definitions of the pieces of the general form later. First, we will focus on how to get the equation of the line into slope-intercept form.

1. Directions: Given the following equations, put them into slope-intercept forms. Use the concept of like-terms that we talked about last week.
   1. y = 3x + 6 + 2x
   2. 3x = y + 8
   3. 3y – 2y = 18 + 3x
   4. 6x = 4 + y
   5. y – 32 = 4x

Name: Answer Key

Date: 7/19/10

Slope-Intercept form notes

What is the general equation for a line in slope-intercept form?

y = mx + b

Note: this is a general form. That means that this equation is the official definition of lines in slope-intercept form.

So, what do the pieces in slope-intercept mean?

y = any y-coordinate on the line

m = slope

x = any x-coordinate on the line

b = y-intercept

1. Directions: Given the following equations, identify the pieces of each line that is in slope-intercept form.
   1. y = 5x + 9

slope = 5

b = 9

* 1. y = 2x – 6

slope = 2

b = -6

* 1. y = -3x + 7

slope = -3

b = 7

We will learn the definitions of the pieces of the general form later. First, we will focus on how to get the equation of the line into slope-intercept form.

1. Directions: Given the following equations, put them into slope-intercept forms. Use the concept of like-terms that we talked about last week.
   1. y = 3x + 6 + 2x

y = 5x + 6

* 1. 3x = y + 8

3x – 8 = y

* 1. 3y – 2y = 18 + 3x

y = 3x + 18

* 1. 6x = 4 + y

6x – 4 = y

* 1. y – 32 = 4x

y = 4x + 32

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Due Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Slope-Intercept Form Homework

(more questions on back)

1. What is the general form of a line in slope-intercept form?
2. From question 1, identify the pieces of the general slope-intercept form equation.
3. Directions: Combine like-terms in order to put the following equations into slope-intercept form.
   1. 3x + 8 = y – 2
   2. 5y + 14 – 3x = 6y
   3. 3x + 15 = y + 8x – 2
   4. 5x + 3y – 2y + 8 = 7x + 3
4. Directions: you are given points a and b. determine the slope of the line that would connect these points
   1. Point a = (4, 8). Point b = (-3, 9)
   2. Point a = (7, 3). Point b = (13, 9)
   3. Point a = (-3, -5). Point b = (0, 10)
   4. Point a = (3, 6). Point b = (-1, 14)

Name: Answer key

Due Date: 7/20/10

Slope-Intercept Form Homework

(more questions on back)

1. What is the general form of a line in slope-intercept form?

y = mx + b

1. From question 1, identify the pieces of the general slope-intercept form equation.

y = any y coordinate

m = slope

x = any x coordinate

b = y intercept

1. Directions: Combine like-terms in order to put the following equations into slope-intercept form.
   1. 3x + 8 = y – 2

3x + 10 = y

* 1. 5y + 14 – 3x = 6y

-3x + 14 = y

* 1. 3x + 15 = y + 8x – 2

-5x + 17 = y

* 1. 5x + 3y – 2y + 8 = 7x + 3

y = 2x – 5

1. Directions: you are given points a and b. determine the slope of the line that would connect these points
   1. Point a = (4, 8). Point b = (-3, 9)

m = (9-8)/(-3-4) = 1/-7

* 1. Point a = (7, 3). Point b = (13, 9)

m = (9 – 3)/(13 – 7) = 6/6 = 1

* 1. Point a = (-3, -5). Point b = (0, 10)

m = (10 + 5)/(0 + 3) = 15/3 = 5

* 1. Point a = (3, 6). Point b = (-1, 14)

m = (14 – 6)/(-1 – 3) = 8/-4 = -2

Name: Abby Simons Date: 7/20/10

Lesson Title: Slope Unit Title: Week 5

Grade Level: 8th

Objectives:

* Students will be able to calculate slope of lines
* Students will be able to demonstrate their knowledge with slopes by noticing trends between the slopes of different lines

Set Induction:

* Take attendance
* Hand back any papers
* Students will take out their homework logs and fill in tonight’s homework. I will come around and sign their logs
* Review slope-intercept form. Ask students what it is. Then ask students what slope is and how you find slope given two points.
* (5 min)

Content Outline and Learning Activities:

* Students will take out their homework from last night – 7/19/10 – Slope-Intercept Form Homework. I will collect when we are finished reviewing. (10 min)
* Hand out slope worksheet. We will complete this worksheet together as a class. (15 min)
* Now, I will have the students draw 4 coordinate planes on a piece of paper. Tell them to draw one line on each quadrant.
  + Line with slope of 0. (horizontal line)
  + Line with slope of undefined. (vertical line)
  + Line with negative slope (going down to – infinity)
  + Line with positive slope (going up to + infinity)
  + Make sure that students understand these trends and are writing these notes in their notebooks.
  + (5 min)
* Now bring up with the students.. what if I wanted a line with a really steep slope? Could I make a generalization that would be true for all examples?
  + First ask the students if they have any ideas
  + I would want the difference in the y coordinates to be really big, with a smaller difference in the x-coordinates. The greater difference in the y-coordinates compared to the run causes the steepness in the lines.
  + Think about it.. if I was to walk up to the top of a building, but move across every inch, I would be moving up the building with a really steep slope. Im going up more than im moving across. Draw pictures on the board for students to copy into their notes.
  + (3 min)
* Now bring up with the students.. what if I wanted a line with a gradual slope?
  + First ask students if they have any ideas
  + I would want the difference in the y coordinates to be really small, and I would want the difference in the x coordinates to be really large. The greater the difference in the x coordinates compared to the rise causes the line to have a shallow slope.
  + Think about it…if I was walking down a ramp, I would want it to be really gradual, so the displacement in the y direction is so much smaller than the displacement in the x direction. Draw pictures on board for students to copy into their notes.
  + (3 min)

Closure:

* Handout homework due tm 7/22/10 – Slopes Homework
* Review what we have been talking about slope the past two days. Have students describe the graphs of lines that have slopes of 0 (horizontal), undefined (vertical), positive (up towards positive infinity), negative (down towards negative infinity), steep (greater difference in the y coordinates), and gradual (greater difference in the x direction)
* (4 min)

Evaluation Procedure:

* Slopes homework due 7/22/10

Additional Notes:

* Slope-Intercept Form Homework answer key from 7/19/10
* Slope Worksheet and graph paper
* Slope Worksheet answers
* Graph paper
* Slopes homework
* Slopes homework answers

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Slope Worksheet

Directions: Calculate the slope between the following points.

1. Point a = (4, 3). Point b = (14, 13)
2. Point a = (-3, -5). Point b = (12, 6)
3. Point a = (1, 1). Point b = (1, 8)
4. Point a = (3, 5). Point b = (8, 5)
5. Point a = (4, 6). Point b = (10, 10)

Once you have calculated the slopes, make a coordinate plane on the piece of graph paper. Then, we will plot each of the points and use the slope to create the lines.

Name: Answers / directions…

Date: 7/20/10

Slope Worksheet

Directions: Calculate the slope between the following points.

1. Point a = (4, 3). Point b = (14, 13)

m = (13 – 3)/ (14 – 4) = 1

1. Point a = (-3, -5). Point b = (12, 6)

m = (6 + 5) / (12 + 3) = 11/15

1. Point a = (1, 1). Point b = (1, 8)

m = (8 – 1) / (1 – 1) = 7/0 UNDEFINED!!! Make sure students understand what this is. Cannot divide a number by 0, so the slope of this line is undefined. Will look like a vertical line

1. Point a = (3, 5). Point b = (8, 5)

m = (5 – 5)/ (8 – 3) = 0/5 = 0 . this line has a slope of zero. Will look like a horizontal line

1. Point a = (4, 6). Point b = (-10, 10)

m = (10 – 6) / (-10 – 4) = 4/-14 = -2/7

Once you have calculated the slopes, make a coordinate plane on the piece of graph paper. Then, we will plot each of the points and use the slope to create the lines.

Number 1. Start with point a and b of problem 1. First plot point a. then using slope, go up one, over one till you get to point b.

Number 2. First plot point a. then using slope go up 11 (positive) and over 15 (to the right) to get to point b.

Number 3. First plot point a. but we know that the slope is undefined, so there is no slope. Plot point b. then connect the dots. What kind of line is this? Vertical. So what can we conclude…that lines with undefined slopes are always vertical lines.

Number 4. Plot point a. but we know we have slope 0. Plot point b. connect the dots. What kind of line is this? Horizontal. What can we conclude about lines with slope of 0, they are always horizontal lines.

Number 5. Plot point a. then using slope, go down (2 is negative) and then over (to the right 7) until you get to point b.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Due Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Slopes Homework

(more on back)

1. Directions identify the slopes of the following lines as positive, negative, gradual, and steep. Note: some graphs can be classified as more than one more option.



d.

c.

b.

a.

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Directions: You are given two points. Find the slope between these two points. Then plot the points, label them, and draw the line connecting the points based of the slopes.
   1. Point a = (8, -2). Point b = (-3, -4)
   2. Point a = (3, -9). Point b = (4, -7)
   3. Point a = (0, 3). Point b = (0, 8)
   4. Point a = (5, 10). Point b = (-3, 6)



Name: answer key

Due Date: 7/21/10

Slopes Homework **(write in answers)**

1. Directions identify the slopes of the following lines as positive, negative, gradual, and steep. Note: some graphs can be classified as more than one more option.



d.

c.

b.

a.

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Directions: You are given two points. Find the slope between these two points. Then plot the points, label them, and draw the line connecting the points based of the slopes.
   1. Point a = (8, -2). Point b = (-3, -4)
   2. Point a = (3, -9). Point b = (4, -7)
   3. Point a = (0, 3). Point b = (0, 8)
   4. Point a = (5, 10). Point b = (-3, 6)



Name: Abby Simons Date: 7/21/10

Lesson Title: x and y intercepts Unit Title: Week 5

Grade Level: 8th

Objectives:

* Students will be able to define the x and y intercepts of a line
* Students will be able to find the x and y intercepts of a line

Set Induction:

* Take attendance
* Hand back any papers
* Have students take out their homework logs and fill in tonight’s homework. I will come around and sign it.
* Review what we did yesterday. We learned what slope is, how to find it, and how we would graph points using slope. So remember that in slope-intercept form, slope is equal to m (the constant in front of the x) in y = mx + b
* (3 min)

Content Outline and Learning Activities:

* Review homework from last night – slopes homework 7/20/10. I will collect the homework when we are finished reviewing. (10 min)
* Now we will talk about x and y intercepts today. Ask students if they have heard about them. Used them before in class, etc… see what students’ responses are (2 min)
* We will start with learning about the y intercept. (students will take notes in their notebooks)
  + As we saw on Monday when we learned about slope-intercept form, we know that the y intercept is the b term in our general slope-intercept form.
  + Write y = mx + b. circle b and label it y-intercept on the board
  + Ask students what an intercept is? It is where the line crosses the axis. We are studying the y-intercept first, so that is where the line crosses the y axis.
  + Draw a coordinate plane on the board. Have students identify where each line crosses the y-axis by looking at the coordinate plane
    - y = 2x + 8 y intercept (0, 8)
    - y = x – 5 (0, -5)
    - y = 4x + 4 (0, 4)
    - where the line hits the y-axis is a point – ordered pair (remind students this)
  + now we will look at another way of finding the y-intercept.
    - From what we know about slope-intercept form, the b term is the y intercept. So, if given the equation of the line we know what the y-coordinate of the intercept will be.
    - But now we have a problem…
    - How do we find the x-coordinate?
      * Well we saw above that all the y-intercepts had a 0 for the x-coordinate. Why is this true? Because the intercept is moving only up and down on the y-axis. There is no movement in the x-direction.
    - So let’s use the concept of substitution or “plugging in” to find the coordinates of the y-intercept.
      * If we want to find the y-intercept, let the x-coordinate of your point be equal to 0.
        + Using the general slope-intercept form, y = m \* (0) + b becomes y = b. So our ordered pair becomes (0, b)
      * Example 1. y = 3x – 18
        + Let x = 0 and solve for y.

y = 3(0) – 18 … y = -18

y intercept is (0, -18)

* + - * example 2. y = -x + 15
        + let x = 0 and solve for y.

y = -1 \* (0) + 15

y intercept is (0, 15)

* + - * example 3. y = 9x + 36
        + let x = 0 and solve for y.

y = 9 \* (0) + 36

y intercept is (0, 36)

* + these are the three ways of finding the y-intercept of a line. Either by looking at the line’s graph, looking at the equation of the line, or substituting in 0 for x in the slope-intercept form of the line.
  + (15 min)
* Now we will move on to finding the x intercept of a line.
  + So ask the students what they think the x intercept is…based off what we just talked about. So the x intercept is where the line crosses the x axis.
  + Using the same coordinate plane as above, with the same lines, have the students look at the graph to identify now the x coordinates.
    - y = 2x + 8 x intercept (-4, 0)
    - y = x – 5 (5, 0)
    - y = 4x + 4 (-1, 0)
    - remember we hit the x-axis at a point, an ordered pair.
  + The other way to find the coordinates of the point that hits the x-axis is by substitution or by “plugging in”
    - Just like for the y intercept that hit the y axis, the x intercept is not moving along the y axis and will be equal to 0. So let’s substitute y = 0 into our general form of the line in slope-intercept form.
      * (0) = mx + b … now solve for x. x = -b/m .. so the general form of the x intercept is (-b/m, 0)
    - Let’s do some examples. Use the same lines that we used to find the y intercepts.
      * Example 1. y = 3x – 18
        + Let y = 0 and solve for x

0 = 3x – 18 … 18 = 3x .. x = 6

X intercept is (6, 0)

* + - * Example 2. y = -x + 15
        + Let y = 0 and solve for x

0 = -x + 15 … -15 = -x … x = 15

X intercept is (15, 0)

* + - * Example 3. Y = 9x + 34
        + Let y = 0 and solve for x

0 = 9x + 36 …. -36 = 9x … x = -4

X intercept is (-4 , 0)

* + So these are the two ways of finding the x-intercepts of a line. Either by looking at the line’s graph or by substituting in 0 for y in the slope-intercept form of the line. (10 min)

Closure:

* Hand out homework due tm 7/22/10 – x and y intercept homework
* Have students state all the methods for finding the x and y intercepts
* (5 min)

Evaluation Procedure:

* X and y intercept homework due 7/22/10

Additional Notes:

* Slopes homework answer key from 7/20/10
* Graph paper
* X and y intercept homework
* X and y intercept homework answer key

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Due Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

x and y intercepts homework

Directions: Find the coordinates of both the x and y intercepts of the following equations. SHOW ALL WORK!!! Note: Some equations may have to be converted first into slope-intercept form.

1. y = 3x – 2
2. 3x + 7x -5 = y – 9
3. 14 + 2x = y
4. 4y – 3y = 15 + 2x
5. y = 6x – 12
6. 24 + 5x + y = 9x – 4

Name: Answer key

Due Date: 7/22/10

x and y intercepts homework

Directions: Find the coordinates of both the x and y intercepts of the following equations. SHOW ALL WORK!!! Note: Some equations may have to be converted first into slope-intercept form.

1. y = 3x – 2

y intercept.. (0, -2)

x intercept.. (2/3, 0)

1. 3x + 7x -5 = y – 9

10x + 4 = y

y intercept.. (0, 4)

x intercept.. (-2/5, 0)

1. 14 + 2x = y

y intercept.. (0, 14)

x intercept.. (-7, 0)

1. 4y – 3y = 15 + 2x

y = 15 + 2x

y intercept.. (0, 15)

x intercept.. (-15/2, 0)

1. y = 6x – 12

y intercept.. (0, -12)

x intercept.. (2, 0)

1. 24 + 5x + y = 9x – 4

y = 4x – 28

y intercept.. (0, -28)

x intercept.. (7, 0)

Name: Abby Simons Date: 7/22/10

Lesson Title: Graphing Equations Unit Title: Week 5

Grade Level: 8th

Objectives:

* Students will be able to graph equations demonstrating their knowledge in t-tables, slopes, and x and y intercepts

Set Induction:

* Take attendance
* Hand back any papers
* Have students take out their homework logs and fill in tonight’s homework. I will come around and sign it.
* Ask students to find the x and y intercepts of the following lines in slope-intercept form.
  + y = 3x – 8 y int. (0, -8)
  + y = 5x + 6 y int. (0, 6)
  + y = x – 2 y int. (0, -2)
* (5 min)

Content Outline and Learning Activities:

* Students will take out their homework from last night 7/21/10 – x and y intercept homework. We will go over the answers together. (5 min) do not collect homework… (only had them find y-intercepts because ran out of time on wed 7/21/10)
* Rest of y-intercept notes from 7/21/10
  + So let’s use the concept of substitution or “plugging in” to find the coordinates of the y-intercept.
    - If we want to find the y-intercept, let the x-coordinate of your point be equal to 0.
      * Using the general slope-intercept form, y = m \* (0) + b becomes y = b. So our ordered pair becomes (0, b)
    - Example 1. y = 3x – 18
      * Let x = 0 and solve for y.
        + y = 3(0) – 18 … y = -18
        + y intercept is (0, -18)
    - example 2. y = -x + 15
      * let x = 0 and solve for y.
        + y = -1 \* (0) + 15
        + y intercept is (0, 15)
    - example 3. y = 9x + 36
      * let x = 0 and solve for y.
        + y = 9 \* (0) + 36
        + y intercept is (0, 36)
  + these are the three ways of finding the y-intercept of a line. Either by looking at the line’s graph, looking at the equation of the line, or substituting in 0 for x in the slope-intercept form of the line.
  + (5 min)
* Finding the x-intercept notes
  + So ask the students what they think the x intercept is…based off what we just talked about. So the x intercept is where the line crosses the x axis.
  + Using the same coordinate plane as above, with the same lines, have the students look at the graph to identify now the x coordinates.
    - y = 2x + 8 x intercept (-4, 0)
    - y = x – 5 (5, 0)
    - y = 4x + 4 (-1, 0)
    - remember we hit the x-axis at a point, an ordered pair.
  + The other way to find the coordinates of the point that hits the x-axis is by substitution or by “plugging in”
    - Just like for the y intercept that hit the y axis, the x intercept is not moving along the y axis and will be equal to 0. So let’s substitute y = 0 into our general form of the line in slope-intercept form.
      * (0) = mx + b … now solve for x. x = -b/m .. so the general form of the x intercept is (-b/m, 0)
    - Let’s do some examples. Use the same lines that we used to find the y intercepts.
      * Example 1. y = 3x – 18
        + Let y = 0 and solve for x

0 = 3x – 18 … 18 = 3x .. x = 6

X intercept is (6, 0)

* + - * Example 2. y = -x + 15
        + Let y = 0 and solve for x

0 = -x + 15 … -15 = -x … x = 15

X intercept is (15, 0)

* + - * Example 3. Y = 9x + 34
        + Let y = 0 and solve for x

0 = 9x + 36 …. -36 = 9x … x = -4

X intercept is (-4 , 0)

* + So these are the two ways of finding the x-intercepts of a line. Either by looking at the line’s graph or by substituting in 0 for y in the slope-intercept form of the line.
  + (10 min)
* Using the equations from the homework sheet last night, the students are going to be given a sheet of graph paper and must graph the first five equations and label their lines and each line must be in a different color marker. They can uses concepts from the week before of using t tables and finding points, and then connecting the dots. They can use the x and y intercepts and the slope of the line to create the line. (15 min)
* (if time)I will introduce other general forms of lines to the students…
  + Point-slope form
    - This form is used if you are given one point a and you are given the slope of the line m…
      * (y – ya) = m(x – xa)
  + Hand out point-slope form worksheet. Go over notes. Then do practice examples with the students.
  + (5 min)

Closure:

* Hand out homework – Graphing Lines in Slope-Intercept Form due 7/23/10
* Review t-tables from last week. Students will have to make t-tables for their homework.
  + Given an equation of a line and either the x coordinates, or the y-coordinates, it is their job to find the other coordinates to find the complete ordered pairs.
* Also, as a class find all the pieces of the line y = 4x – 9
  + Slope = 4
  + Y intercept = (0, -9)
  + X-intercept = (9/4, 0)
* (5 min)

Evaluation Procedure:

* Homework - Graphing Lines in Slope-Intercept Form due 7/23/10

Additional Notes:

* x and y intercept homework answer key from 7/21/10
* graph paper
* rulers
* markers
* Piece of graph paper made to show students with the graphs of all 6 equations from 7/21/10 homework. Equations of lines labeled and in different color markers.
* Point-slope form worksheet
* Point-slope form worksheet answers
* Graphing Lines in Slope-Intercept Form Homework AND GRAPH PAPER
* Graphing Lines in Slope-Intercept Form Homework Answer Key

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Point-Slope Form Worksheet

Point-slope form is another form that is used to represent the equations of lines. You would use point-slope form if you were given one point called point a, and the slope of the line (m). The general form of a line in point-slope form looks like…

(y – ya) = m \* (x – xa)

Now, let’s do some practice with point-slope form.

1. Find the equation of a straight line that has a slope m = 4 and passes through the point (-1, -6).
2. Find the equation of a straight line that has a slope m = -2 and passes through the point (5, 3).
3. Find the equation of a straight line that has a slope of m = 1 and passes through the point (2, 2).

Name: Answer Key

Date: 7/22/10

Point-Slope Form Worksheet

Point-slope form is another form that is used to represent the equations of lines. You would use point-slope form if you were given one point called point a, and the slope of the line (m). The general form of a line in point-slope form looks like…

(y – ya) = m \* (x – xa)

Now, let’s do some practice with point-slope form.

1. Find the equation of a straight line that has a slope m = 4 and passes through the point (-1, -6).

(y + 6) = 4 \* ( x + 1)

y + 6 = 4x + 4 (distributive property)…(now put in slope intercept form using like terms)

y = 4x – 2

1. Find the equation of a straight line that has a slope m = -2 and passes through the point (5, 3).

(y + 3) = -2 \* (x – 5)

y + 3 = -2x + 10

y = -2x + 7

1. Find the equation of a straight line that has a slope of m = 1 and passes through the point (2, 2).

(y – 2) = 1 \* (x – 2)

y – 2 = x – 2

y = x

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Due Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Graphing Lines in Slope-Intercept Form Homework

Directions: You are given 4 equations. For each equation fill out a T-table, find the slope, x-intercept, and y-intercept of the line. On the piece of graph paper given, draw a coordinate plane, label the axes and fill in the numbers up to 10 on the axes. Graph the 4 equations and label them on the graph.

**Line A**

y = 3x – 8

|  |  |
| --- | --- |
| x | y |
| -1 |  |
| 0 |  |
| 2 |  |
| 3 |  |

Slope =

x-intercept =

y-intercept =

**Line B**

y = -x + 6

|  |  |
| --- | --- |
| x | y |
| -1 |  |
| 0 |  |
| 2 |  |
| 6 |  |

Slope =

x-intercept =

y-intercept =

**Line C**

y = 5x + 3

|  |  |
| --- | --- |
| x | y |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |

Slope =

x-intercept =

y-intercept =

**Line D**

y = -2x – 4

|  |  |
| --- | --- |
| x | y |
| -2 |  |
| -1 |  |
| 0 |  |
| 2 |  |

Slope =

x-intercept =

y-intercept =

Name: Answer Key

Due Date: 7/23/10

Graphing Lines in Slope-Intercept Form Homework

Directions: You are given 4 equations. For each equation fill out a T-table, find the slope, x-intercept, and y-intercept of the line. On the piece of graph paper given, draw a coordinate plane, label the axes and fill in the numbers up to 10 on the axes. Graph the 4 equations and label them on the graph.

**Line A**

y = 3x – 8

|  |  |
| --- | --- |
| x | y |
| -1 | -11 |
| 0 | -8 |
| 2 | -2 |
| 3 | 1 |

Slope = 3

x-intercept = (8/3, 0)

y-intercept = (0, -8)

**Line B**

y = -x + 6

|  |  |
| --- | --- |
| x | y |
| -1 | 7 |
| 0 | 6 |
| 2 | 4 |
| 6 | 0 |

Slope = -1

x-intercept = (6, 0)

y-intercept = (0, 6)

**Line C**

y = 5x + 3

|  |  |
| --- | --- |
| x | y |
| -1 | -2 |
| 0 | 3 |
| 1 | 8 |
| 2 | 13 |

Slope = 5

x-intercept = (-3/5, 0)

y-intercept = (0, 3)

**Line D**

y = -2x – 4

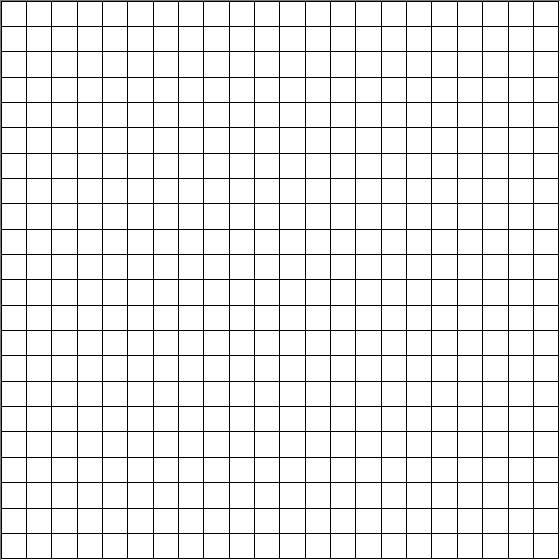
|  |  |
| --- | --- |
| x | y |
| -2 | 0 |
| -1 | -2 |
| 0 | -4 |
| 2 | -8 |

Slope = -2

x-intercept = (-2, 0)

y-intercept = (0, -4)

\*\*\*\*ON PIECE OF GRAPH PAPER, DRAW IN EACH GRAPH IN DIFFERENT COLORED MARKERS



Name: Abby Simons Date: 7/23/10

Lesson Title: Graphing Equations in Excel Unit Title: Week 5

Grade Level: 8th

Objectives:

* Students will be able to graph equations using Microsoft excel

Set Induction:

* Take attendance
* Hand back any papers
* (2 min)

Content Outline and Learning Activities:

* Review homework from last night. Make sure to go around classroom and check everyone’s homework before going over it. Collect homework when finished reviewing. (10 min)
* Go to the computer lab (5 min)
* Today we will be learning how to graph lines on the computer using Microsoft excel. First we will graph a line together. Hand out introduction to graphing worksheet. Go through with the students. (10 min)

Closure:

* No homework it’s Friday
* Log out, shut down, push seats in, and go back to classroom.
* (5 min)

Evaluation Procedure:

* No homework, it’s Friday

Additional Notes:

* Graphing Lines in Slope-Intercept Form homework answer key from 7/22/10
* Introduction to Graphing Lines worksheet

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Introduction to Graphing Worksheet

1. Turn on the computer
2. Log into the students account
3. Open up Microsoft Excel
4. We will do two examples together with the class
   1. We want to graph a line that connects the two points (1, 2) and (3, 4)
      1. First write in our points.
         1. In column A row 1, put the x-coordinate of the first point, 1.
         2. In column A row 2, put the y-coordinate of the first point, 2.
         3. In column B row 1, put the x-coordinate of the second point, 3.
         4. In column B row 2, put the y-coordinate of the second point, 4.
      2. Then, highlight the 4 boxes with the points in them.
      3. Click on the tab that says insert.
      4. Click on the scatter button (looks like a graph with many points in it) and then click on the image with many points and is called scatter with only markers.
      5. A graph should appear with the two points on it. Check to make sure the ordered pairs are correct.
      6. Then right click on one of t